ForU: AN APPLICATION FOR WOMEN SAFETY USING IoT AND ML APPROACHES

Rajiv Lochan Singh[1], Rahul Prasad Sah[2], Uday Kumar[3], Chandrakala B.M[4]

[1-4]*Department of ISE, Dayananda Sagar College of Engineering, Bangalore, Karnataka, India*

Abstract: *We live in a society in which criminal activities are increasing at an alarming rate. Crime against women is a major concern in our society and we are unable to eradicate it completely. In 21st century the use of smart devices has been increased significantly and almost everyone is well familiar with smartphone and its related technologies. Smartphone can be used very effectively to deal with crime against women. In our application we are ensuring women safety by making use of both software and hardware components. Our application can be triggered by long pressing the button present beneath the ring. After that the application will send location and will give automatic call to the saved contact and will inform via SMS too. In our application we are providing location based services in which user gets alert of locations based on the movement of victim & application will alert user on the basis of past crime records of any given area.*

Keywords- Women Safety, Android App, Women Rights, Secure Women, Empower Women

1. INTRODUCTION

It is well known fact that the still in 21st century women does not enjoy much freedom as the men have.One of the primary reason for this difference in equality is crime against women. Recent incident in Hyderabad was very frightening and it shook the entire nation. After this incident every guardian is advocating about the women security and it is there topmost concern. We know that smart devices are easily available nowadays. The low cost and the great feature has provoked almost everyone to buy smart devices. Out of all smart devices the market of Android devices is very high,. According to the survey almost 70% population uses Android enabled phone, the reason of popularity of Android enabled phone is that it is free of cost, open source and easily customizable operating system. Android internally uses flavour of Linux 2.6 operating system which is written purely in C language, along with it Android uses another step down version of open source language that is Java to provide application framework.

Our application ensures safety in 4 steps:

1. At first, save the contact number of parents & police in the application by using the buttons given on interface.
2. In case of emergency long press the button beneath the ring so that the application should get triggered automatically.
3. Red Zone: Alert the user about the dangerous areas encountered by him on the basis of past crime rates. This is the unique feature of our application.
4. Location of victim will be sent to police & uniform resource locator will help in getting the precise location of the victim.

2. EXISTING SYSTEMS

In the existing system almost all the applications are using mainly Android application without any hardware support in our literature survey we have referred to few applications that offers similar functionalities. Our main motto is to improve those application so that they can be utilised effectively.

2.1 Abhaya-An android app for the safety of women: The main feature of this application is to keep sending location of women in every 5 minutes until she presses the 'stop' button in the application. URL of victim is sent through GPS in a single click. Women activity is continuously tracked through the application and is sent in the interval of 5 minutes. The main drawback of this application is that it requires an Internet connection. If there is some interruption in connection then application will might fail and therefore it will lead to a problem.

2.2 Humsafar App: This application works well in the public transportation system. Its working is based on the concept of 'Swarm Intelligence' to form a group of commuters based on shared travel routes and places of destination. Public transportation will help in reducing the pollution level in the atmosphere. It also helps in managing traffic quite well and prevents congestion on the roads. If a woman deviates from its saved path, then the application will get triggered automatically .The main disadvantage of this application is that not everyone uses public transportation. So this app will not be reliable with those, who opt for private transportations means like scooter and car.

2.3 Street Smart-Safe street app for women using augmented reality: This Android application mainly uses GPS navigation, camera and internet connection. The user will come to know about the area by just holding the camera. On the basis of past reviews it will

be informed to the user that whether the area is safe or not. Using augmented reality application will give recommendation that whether it is safe or dangerous to travel to a particular street. The main drawback is that user needs to call their parents & police if they are feeling unsafe. But we all are well familiar that in these type of scenarios, generally victim doesn't have much time to respond.

3. PROPOSED SYSTEM

Our main aim is to develop system for Android users. We are connecting our Android application with an IoT device. There is a button in the IoT device which is used to trigger the application in the crisis circumstances. GPS module is used to detect the exact location of person if she is in some trouble. System is divided into following modules:

1. Tracking of the location of victim for GPS is done by first module
2. Second module is used for receiving the exact location in the form of URL by the parents and police.

Our application uses past crime dataset which will help in predicting the user that whether an area is safe or unsafe to travel. User can check this feature through a given button on the interface & if unsafe areas detected, user should opt for alternate path to reach at the destination. IoT device plays a crucial role in the system working.

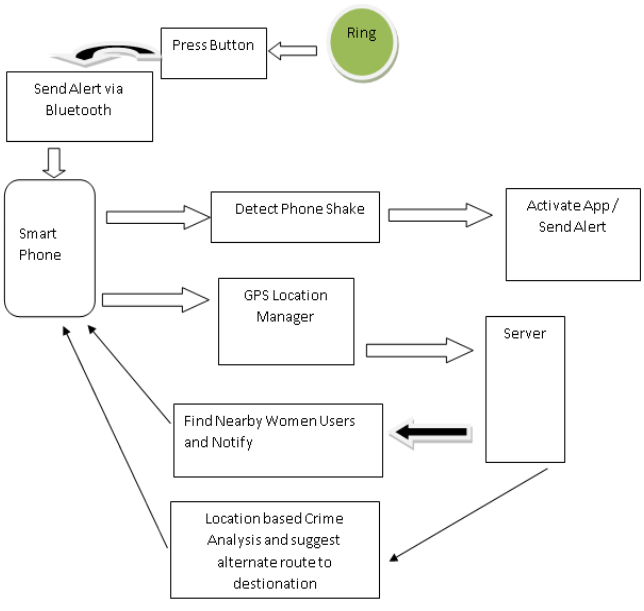

Figure 1: Overview of Application Architecture

3.1 Expected results and uniqueness

Expected result is evaluation in the following steps: At first user is supposed to enter the details of their parent and close friends and add as many people as they want as per their requirement scenes. This step is immediately after the Application has been installed. Enter the details and save it using the save button. Second step deals with the triggering of application music and long press the button on the IoT device so that application should automatically start. Once the application starts, a pop-up comes on the screen that whether user is safe or not & if the user doesn't respond in 10 seconds then application start its functioning normally. Location of the victim is sent through GPS in the form of URL to her parents and police for immediate help. Location will keep on updating as per the victims movement.

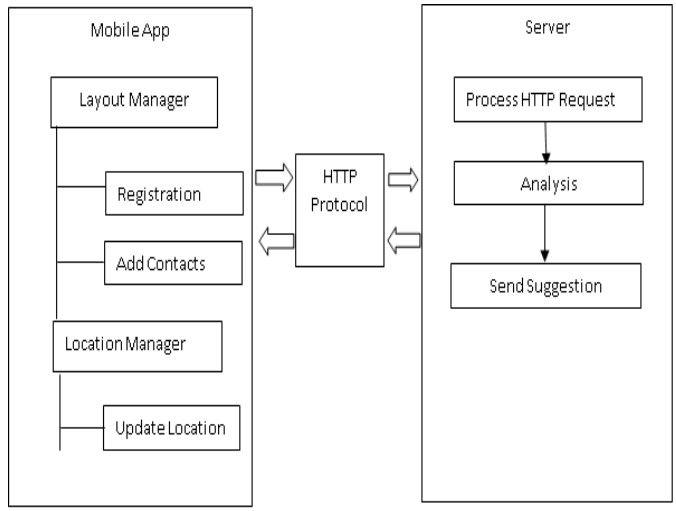

Figure 2: Module Flow Diagram

Above Module Flow Diagram consists of mainly two parts; Mobile application and the server, which are communicating by using the HTTP Protocol. Mobile application is further divided into two subparts: Layout Manager & Location Manager. In Layout manager registration is done & contacts are further added. Location manager is used to update the location of the user as per her movement. Mobile application will send its request to the server via the HTTP Protocol. Server will perform its normal operation which involves processing the http request, doing crime analysis and sending alternate route suggestions & sending back its response to the application.

3.2 Uniqueness

Previous application were mainly concerned with sending the location by using software only but our application is based on the principle of IoT which is the interconnection of systems among themselves. In case of crisis circumstances user may not get a chance to open her mobile and may got stucked in the application. In case of kidnapping, kidnappers generally used to grab the hands of victim in a fraction of seconds, therefore not giving any single second time to respond. Our IoT device will work in those circumstances also. Therefore it will give an edge to the existing systems.

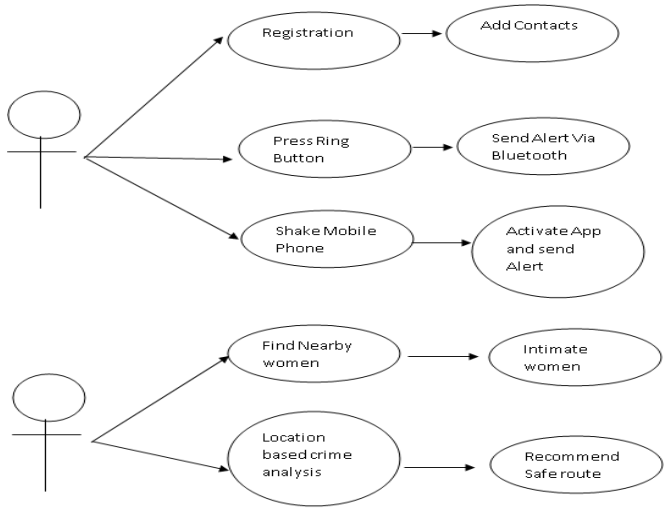

Figure 3: Use Case diagram

4. CONCLUSION

In our paper- 'ForU' which is an application compatible with Android devices for the safety of women. The application plays a crucial role in getting the precise location of victim if she gets stuck in some dangerous situation .The main advantage of this application is that location of victim can be shared without even touching the smartphone. There is scope to make our application compatible with iOS platforms and government can promote these application to help the police department.

5. REFERENCES

[1] Humsafar App :
-Moni Arora, Nisha Kaushik, Tanya Jain, Baljeet Kaur, Pooja Vashisth, Kamakshi Khosla, Suruchi Bhatia
https://ieeexplore.ieee.org/document/7913204

[2] Abhaya : An Android App For The Safety Of Women
-Ravi Sekhar Yarrabothu, Bramarambika Thota
https://ieeexplore.ieee.org/document/7443652

[3] Street Smart : Safe Street App For Women Using Augmented Reality- Priya Chaudhari, Ramkumar Kamte, Kartik Kunder, Ann Jose, Sweedle Machado
https://ieeexplore.ieee.org/document/8697863

[4] A Wearable Fabric-Based RFID Skin Temperature Monitoring Patch. Researchgate 2016
www.researchgate.net/publication/313808007

[5] An Autonomous Wireless Body Area Network Implementation Towards IoT Connected Healthcare Applications. IEEE 2017
www.ieeexplore.ieee.org/document/7950903

[6] Wearable Environmental Sensors and Infrastructure for Mobile Large-Scale Urban Deployment. IEEE 2016
www.ieeexplore.ieee.org/abstract/document/7552514

[7] Smart, low power, wearable multi-sensor data acquisition system for environmental monitoring. Researchgate 2017
www.researchgate.net/publication/315576320

[8] In 2016, Taiyang Wu, Jean-Michel Redout´and Mehmet Rasit Yuce. An Autonomous Wireless Body Area Network Implementation Towards IoT Connected Healthcare Applications.

[9] In 2016, Erik Wilhelm, Sandra Siby, Yuren Zhou, Xavier Jayaraj Siddarth Ashok, Melani Jayasuriya, Jacksheeng Kee, Kristin L. Wood, and Nils Ole Tippenhauer. Wearable Environmental Sensors and Infrastructure for Mobile Large-scale Urban Deployment.

[10] In 2009, Premkumar. Francis Tsow, Erica Forzani, Anant Rai, Rui Wang, Ray Tsui, Sal Mastroianni, Christopher Knobbe, A. Jay Gandolfi, and N. J. Tao. A Wearable and Wireless Sensor System for Real-Time Monitoring of Toxic Environmental Volatile Organic Compounds.

[11] In 2017, Xicai Yue, Matthias Kauer, Mathieu Bellanger, Oliver Beard, Mike Brownlow, Des Gibson, Caspar Clark, Calum MacGregor, and Shigeng Song. Development of an Indoor Photovoltaic Energy Harvesting Module for Autonomous Sensors in Building Air Quality Applications.